

Rediscovery of the Aquatic Gastropod
Helisoma eucoosmium (Bartsch, 1908),
(Basommatophora: Planorbidae)

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ABSTRACT—A population of *Helisoma eucoosmium* (Bartsch, 1908), a small freshwater planorbid snail considered to be extinct by some authors, has been discovered in Town Creek, a tidal swamp stream in southeastern North Carolina. This rediscovery will permit a definitive determination of the proper systematic placement of the taxon. In the absence of live specimens, past analysis of this taxon during systematic revisions of the Planorbidae relied only on shell morphology of type material. Under this circumstance, this taxon was variously placed in both tropical and temperate genera and, compounding that problem, was treated as a full species by some authors and a subspecies by others. Its apparently limited range elevates concern for the conservation of planorbid snail diversity in southeastern North Carolina because it is the second taxon with a severely restricted distribution to be found in this rapidly urbanizing region.

Helisoma eucoosmium (Bartsch, 1908) is a small, distinctive planorbid snail which was collected and described from Greenfield Lake, a millpond constructed prior to 1750 (Adams 1990a). This site is located within the City of Wilmington, New Hanover County, North Carolina, and is on a tributary to the lower Cape Fear River. During the past few decades, repeated attempts to recollect *H. eucoosmium* in Greenfield Lake and elsewhere within the region have been unsuccessful (Fuller 1977, Adams 1990a). This fact, combined with the water quality degradation in many regional streams, has led many investigators to treat the taxon as extinct (Opler 1976, Imlay 1977, Palmer 1985) or possibly extinct (Fuller 1977, Adams 1990b).

During the spring of 1994, while performing a survey of the mollusks of Town Creek, a tidal swamp stream tributary to the lower Cape Fear River in adjacent Brunswick County, SGB discovered a population of *Helisoma euosmium* approximately 14.5 km (9 mi) SSW of the type locality (Fig. 1). Although much of this stream system remains to be investigated, the taxon is known to occupy at least a 1.75 km (1.1 mi) stretch of the main creek. Five specimens were deposited in the invertebrate research collection at the North Carolina State Museum of Natural Sciences, Raleigh (NCSM). All conform precisely to the original shell description given by Bartsch (1908), particularly in displaying the chestnut-colored bands (Figs. 2 and 3). The largest specimen (NCSM #P1207), collected on 30 April 1994, has a greater diameter of 6.0 mm, a lesser diameter of 4.75 mm, and a height of 3.0 mm. It was probably an adult that overwintered, a likelihood suggested by its size and the minor pitting and corrosion of the shell surface. Three specimens taken in early July 1994 (NCSM #P1208) are smaller; average dimensions of three specimens are maximum diameter 3.8 mm, minimum diameter 3.0 mm, and height 1.9 mm ($n = 3$). Similarly-sized specimens taken from the same period laid eggs in captivity indicating that sexual maturity had been attained.

The molluscan community in the freshwater part of Town Creek is diverse; species encountered to date are listed in Table 1. Continuing surveys may disclose additional species and most of those historically documented (Adams 1990a) from the type locality of *Helisoma euosmium* may ultimately be found.

In his description, Bartsch (1908) assigned *Helisoma euosmium* and a subspecies from Louisiana, *H. euosmium vaughani*, to the genus *Planorbis* Müller 1774. F. C. Baker (1931) restricted that genus to species of European origin and, without examination of soft tissue anatomy, provisionally placed *euosmium* in the genus *Helisoma* Swainson 1840. In his subsequent monograph on the Planorbidae, Baker (1945) retained this assignment, placing it alone with *Helisoma anceps* (Menke, 1830) in the subgenus *Helisoma* s.s.; however, he made no reference to anatomical examinations supporting this placement. On the strength of unpublished observations by J. P. E. Morrison of live individuals of *H. e. vaughani* from Louisiana, Fuller (1977) tentatively assigned the species to the Central American genus *Taphius* H. & A. Adams 1855. *Taphius* and other planorbid genera of tropical affinity (*Afroplanorbis* Thiele 1931, *Biomphalaria* Preston 1910, *Australorbis* Pilsbry 1934, *Tropicorbis* Pilsbry and Brown 1914, *Planorbina* Haldeman 1842, *Armigerus* Clessin 1884, and *Platytyphius* Pilsbry 1924) have long been the subjects of taxonomic debate and divergent systematic treatment,

Table 1. Freshwater mollusks of upper Town Creek, Brunswick County, North Carolina, 1994.

| Gastropods | Bivalves |
|---------------------------------------|------------------------------------|
| Viviparidae | Unionidae |
| <i>Campeloma decisum</i> (Say) | <i>Pyganodon cataracta</i> (Say) |
| Hydrobiidae | <i>Villosa delumbis</i> (Conrad) |
| <i>Amnicola limosus</i> (Say) | <i>Ligumia nasuta</i> (Say) |
| <i>Gillia altilis</i> (Lea) | Unknown taxa of the |
| Physidae | <i>Elliptio complanata</i> and |
| <i>Physella hendersoni</i> (Clench) | <i>Elliptio icterina</i> complexes |
| Planorbidae | Corbiculidae |
| <i>Micromenetus dilitatus</i> (Gould) | <i>Corbicula fluminea</i> (Müller) |
| <i>Helisoma eucoosmium</i> (Bartsch) | Sphaeriidae |
| <i>Planorbella trivolvis</i> (Say) | <i>Eupera cubensis</i> (Prime) |
| Ancylidae | <i>Musculium securis</i> (Prime) |
| <i>Laevapex fuscus</i> (C. B. Adams) | Unidentified sphaeriids |

a problem generated and sustained by years of inconclusive taxonomic studies resulting from the great similarity in chonchology and anatomy existing within a genus complex of worldwide distribution (Hubendick 1955, H. B. Baker 1960). While taxonomic and systematic problems are common in the freshwater gastropods, the need for nomenclatural stability within the tropical planorbids is a matter of great medical and economic importance because these snails are intermediate hosts of the human parasite *Schistosoma mansoni*.

In response to a petition by Wright (1962), the International Commission on Zoological Nomenclature (1965) issued Opinion 735, ruling that *Biomphalaria* is to be given precedence over the generic names *Taphius*, *Planorbina*, and *Armigera* when any or all of these names are considered to apply to the same genus. Under this ruling, Fuller's (1977) binomen would be valid only if *Taphius* is determined to be separable from *Biomphalaria* at the genus level. Bypassing this issue, Burch (1982, 1989) stated *Helisoma eucoosmium* may be a "form or juvenile" of *Helisoma anceps* (Menke, 1930) and, therefore, did not grant it specific status. Based on shell morphology and the reproductive maturity of the material collected from Town Creek, we find no evidence to support this possibility. Although the very oblique aperture of *H. eucoosmium* is suggestive of the *Biomphalaria* group, the lack of vertically depressed whorls is not; therefore, we provisionally accept Baker's

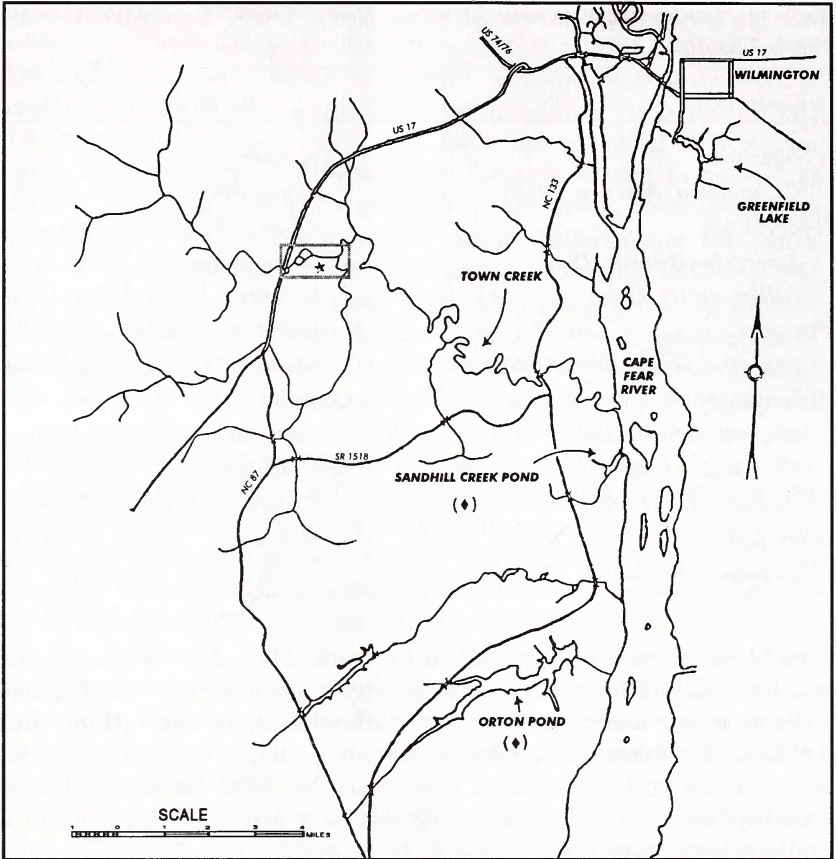


Fig. 1. Town Creek and vicinity (★ = known range of *Helisoma eucosmium*, ◆ = known sites of *Planorbella magnifica*).

(1945) designation pending definitive studies of soft tissue anatomy.

Over much of its length, Town Creek is a tidal system approximately 30–50 m wide with maximum depths varying between 5–7 m. Whereas the lower reaches are brackish, no salinity has been detected in the area where *Helisoma eucosmium* occurs. Physical parameters of the water are pH 5.1–7.0 (\bar{x} = 6.1, n = 3), conductivity 217 $\mu\text{mhos/cm}$ (n = 2), and calcium concentration 107.9 ppm (n = 2). All specimens of *H. eucosmium* came from a littoral community, occurring in less than 3 m of water, consisting of dense continuous mats of Brazilian elodea (*Egeria densa* Planchon), fanwort (*Cabomba caroliniana* Gray), fragrant waterlily (*Nymphaea odorata* Aiton), spatterdock (*Nuphar luteum* (Linnaeus)), and floating-heart (*Nymphoides aquatica* (Walter)).

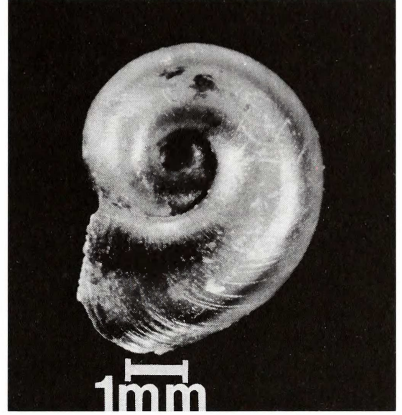
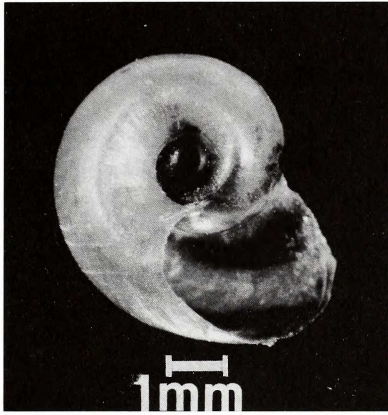


Fig. 2. Dorsal, ventral, and apertural views of *Helisoma eucosmium* (NCSM #P1208). Lip aperture is incomplete.

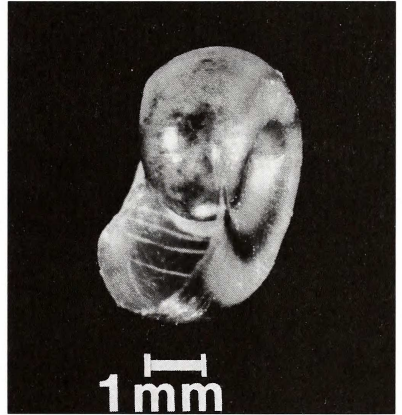


Fig. 3. Foraging *Helisoma eucosmium*.

Streambank forest cover, typical of southern swamps, consists of bald cypress (*Taxodium distichum* (Linnaeus)), tupelo gum (*Nyssa aquatica* Linnaeus), red maple (*Acer rubrum* Linnaeus), and water ash (*Fraxinus caroliniana* Miller).

Our report of *Helisoma eucosmium* constitutes the second recent recollection of a likely "extinct" planorbid snail in the Cape Fear River drainage of southeastern North Carolina, the other being the rediscovery of *Planorbella magnifica* (Pilsbry) in Orton Pond (Adams 1988) and in Sandhill Creek Pond (Adams 1993), approximately 14.5 km (9.0 mi) SE and 12 km (7.5 mi) ESE, respectively (Fig. 1). Because of the heavy residential and industrial development that has occurred in southeastern North Carolina within the past half-century, these waterbodies might hold some of the few remaining populations of the original freshwater molluscan fauna of the lower Cape Fear Basin. If *H. eucosmium* is restricted to Town Creek and systematic research determines that it warrants full species rank, protection under state and federal conservation laws might be warranted. Although the Town Creek watershed is still very rural, covered primarily in crop and forest lands, the surrounding region is urbanizing rapidly, and the stream will surely be impacted by this trend. Consequently, additional surveys to determine the distribution of *H. eucosmium* and resolution of outstanding systematic issues are urgently needed.

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